

TAXONOMY OF GYMNO LAENA (DC.) RYDB. (COMPOSITAE: TAGETEAE)

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In his revision of *Dyssodia*, De Candolle (1836) placed *Dyssodia serratifolia* in the section *Gymnolaena*, naming the section for the absence of calyculum. Rydberg (1915) elevated the section to generic rank and recognized four taxa: *Gymnolaena serratifolia*, *G. oaxacana*, *G. integrifolia* and *G. seleri*. While studying specimens of these taxa as part of routine herbarium work preliminary to the preparation of a monograph of *Dyssodia*, I found that two of Rydberg's combinations are synonyms for species of *Dyssodia*. These names are, therefore, excluded from *Gymnolaena* and listed as such below. The remaining species and a third described in this treatment make up, in my judgement, a neat, quite distinct genus, *Gymnolaena*.

Gymnolaena combines in a unique manner some of the most salient characters of *Dyssodia* and *Tagetes* as shown in the following list:

<i>Dyssodia</i> (<i>Eudyssodia</i> sensu O. Hoffm. 1894)	<i>Gymnolaena</i>	<i>Tagetes</i>
Leaves rarely with glands scattered over the lamina	Glands scattered over the lamina	Glands scattered over the lamina
Capitula borne singly	Capitula borne singly or in cymose clusters	Capitula borne singly or in cymose clusters
Calyculum usually present	Calyculum absent or very reduced	Calyculum absent
Phyllaries biseriate	Phyllaries uniseriate	Phyllaries uniseriate
Phyllaries free or partially connate	Phyllaries connate high up	Phyllaries connate high up
Receptacle fimbriate	Receptacle foveolate, naked or minutely fimbriate	Receptacle foveolate, naked
Pappus usually of dissected squamellae	Pappus of dissected squamellae	Pappus of truncate and aristate scales
Style branches with long, subulate appendages	Style branches with long, subulate appendages	Style branches truncate or with short, conic appendages

It is apparent that *Gymnolaena* can not be comfortably included in either *Dyssodia* or *Tagetes*. The three genera are consequently maintained with *Gymnolaena* occupying an intermediate position between *Tagetes* and *Dyssodia*.

GYMNOLAENA (DC.) Rydb., N. Am. Fl. 34:160. 1836.

Dyssodia sect. *Gymnolaena* DC., Prodr. 5:641. 1836.

Glabrous or puberulent shrubs, 1.0-2.4 m high. Leaves opposite (both opposite and alternate in one specimen of *G. oaxacana*, Smith 384, GH), simple, subsessile to short-petioled, lanceolate to ovate, serrate, glabrous to puberulent, glandulose. Heads peduncled, single or in cymose clusters; calyculum absent or of 1-3 inconspicuous linear bracts; involucre cylin-

dric, 1-2 cm high, 5-10 mm through; phyllaries 5-13, uniseriate, connate nearly to the tips, streaked with glands. Receptacle convex, foveolate, naked or minutely fimbriate. Rays 5-12, yellow to red-orange, pistillate, fertile; disc florets 10-40, perfect, corollas 9-12 mm long, tube and throat slender, about equal, tube puberulent lobes slender, unequal; style branches with long, subulate appendages. Pappus of 15-20 squamellae, each dissected into 5-10 unequal bristles; achenes obpyramidal, 4-6 mm long, pubescent. Type species: *Dyssodia serratifolia* DC.

Key to species of *Gymnolaena*.

1. Capitula borne in cymose clusters at the tips of branches; involucre 10-12 mm high; phyllaries ca 5. 1. *G. serratifolia*
1. Capitula borne singly; involucre more than 12 mm high; phyllaries 6-13.
 2. Leaves 2-5 (-9) cm long; phyllaries 6-9, each with 4-9 elongate-linear glands. 2. *G. oaxacana*
 2. Leaves (5-) 8-15 cm long; phyllaries ca 13, each with 11-25 short, elliptic glands. 3. *G. chiapasana*

1. GYMNOLAENA SERRATIFOLIA (DC.) Rydb., N. Am. Fl. 34:161. 1915.

Dyssodia serratifolia DC., Prodr. 5:641. 1836. HOLOTYPE (G, not seen): Mexico. "Oaxaca ad Atitla et locos vicinos," *Alaman* s.n. Phototypes: F! GH! MO! US!

Hymenatherum serratifolium (DC.) Hemsl., Biol. Cent. Amer. Bot. 2:221. 1881.

Glabrous shrubs to 2 m high. Leaves opposite, slenderly elliptic to lanceolate, 3-8 cm long, 1-2 cm wide, short petioled, dotted with numerous small glands, margins finely serrate. Heads borne in cymose clusters at the tips of branches, peduncles 1-3 (-5) cm long, 3-4 bracteate, the bracts 2-4 mm long, bearing 1-3 small, swollen glands; calyculum of 0-3 small, inconspicuous bracts, similar to those of the peduncles; involucre cylindric, 10-12 mm high, 4-5 mm through; phyllaries 5, in a single series, connate up to the short, deltoid, puberulent tips, each phyllary streaked with 2-4 vertical rows of elongate glands each basally indurate. Receptacle flat to convex, short-fimbriate. Ray florets 5 (-8), corollas yellow, tube 5-6 mm long, puberulent, lamina 4-5 mm long, 3-4 mm wide; disc florets 10-20 corollas dull yellow with dark veins, 9 mm long, tube ca 3 mm long, puberulent, throat only slightly dilated, lobes lanceolate, unequal, 1.5-2.5 mm long; style branches bearing long, hispidulous, subulate appendages. Pappus of 15-20 squamellae, each dissected into 5-9 bristles 6-9 mm long; achenes obpyramidal, ca 4 mm long, appressed hirsute.

Distribution (Fig. 1): Known only from three collections from central Oaxaca; ca 1700 m.

Specimens examined: Oaxaca; Matatlan, Dist. de Tlacolula, 13 Aug 1920, C. Conzatti 4033 (US); Near Mitla, Oaxaca Valley, 13 Nov 1894,

C. L. Smith 378 (MICH, MO, NY, TEX).

2. *GYMNOLAENA OAXACANA* (Greenm.) Rydb., *N. Am. Fl.* 34:160. 1915.

Dyssodia oaxacana Greenm., *Field Mus. Pub. Bot.* 2:273. 1907. HOLOTYPE (F!): Mexico. Almoloyas, Oaxaca, 25 Dec 1906, *C. Conzatti 1653*. ("fragment in hb. De Candolle", not seen)

Shrubs, 1.0-2.4 m high; young stems terete, puberulent, weakly striate. Leaves opposite (sometimes alternate in the same plant), simple, ovate to lanceolate, 2-9 cm long, 6-12 (-30) cm wide, serrate to dentate, glabrous to sparsely puberulent, dotted with numerous glands scattered over the blade, usually with a gland in each cusp of the margins. Peduncles solitary, 3-5 (-12) cm long, 3-4 (-10) bracteate, swollen just beneath the heads; calyculum of 0-3 linear-subulate bracts, 3-4 mm long, bearing 1-3 subterminal glands; involucre cylindrical, 12-15 (-18) mm high, ca 5 mm through; phyllaries 6-9, usually 8, in a single series, united almost to the short, deltoid, puberulent tips, each phyllary basally indurate, streaked with 4-9 conspicuous, elongate-linear glands, splitting to the base in 2's and 3's at maturity. Receptacle convex to conic, foveolate, naked or minutely fimbriate. Ray florets 8 or fewer, corollas orange, tube ca 5 mm long, slender, sparsely puberulent lamina oval-elliptic, 7-9 mm long, 3-5 mm wide; disc florets 15-30, corollas dull yellow, 9-10 (-12) mm long, slender, tube ca 4 mm long, sparsely puberulent, lobes unequal, 1-2 mm long, style branches with long, subulate appendages. Pappus of ca 20 squamellae, each dissected into 5-9 bristles, the central bristle longer and coarser than the lateral ones, about equalling the disc corollas; achenes slender, obpyramidal, 6 mm long, subsericeous.

Distribution (Fig. 1): Among rocks on gravelly soils; thorn-scrub to semi-evergreen forests; southern Puebla and northern Oaxaca; 800-1800 m. Jul.-Dec.

Specimens examined: Oaxaca: Between Nochixtlan and Parian, 20-23 Dec 1936, *W. H. Camp 2558* (NY); Dist. Nochixtlan, 12 Oct. 1921, *C. Conzatti 4251* (US); Las Hoyas Canyon, 2 Nov 1894, *C. G. Pringle 6028* (BM, F, GH, LE, MICH, MO, MSC, NY, US); "Cuauhtlilla", 28 Nov 1895, *C. & E. Seler 1535* (NY, US); Below Jayacatlan, 9 Feb 1895, *L. C. Smith 384* (GH). Puebla: Rocks, Cerro de Coatepe, Aug 1907, *C. A. Purpus 2535* (UC); Coxcatlan, Sept 1909, *C. A. Purpus 4119* (BM, F, GH, MO, NY, UC, US); Las Salinas, near Zapotitlan, Sept 1911, *C. A. Purpus 5621* (BM, F, GH, MO, NY, UC, US); Tehuacan area, above Calipan, along Barranca de los Mangos, 13 Jul 1961, *C. E. Smith et al. 3743* (F, GH, NY).

3. *GYMNOALENA chiapasana* Strother, sp. nov.

HOLOTYPE (BM!): Mexico. Chiapas, etc., ann. 1864-1870, *Ghiesbreght 519*. Isotypes: GH! MO! NY!

Folia lanceolata attenuata (5-) 8-15 cm. longa 1.5-3.5 cm. lata. In-

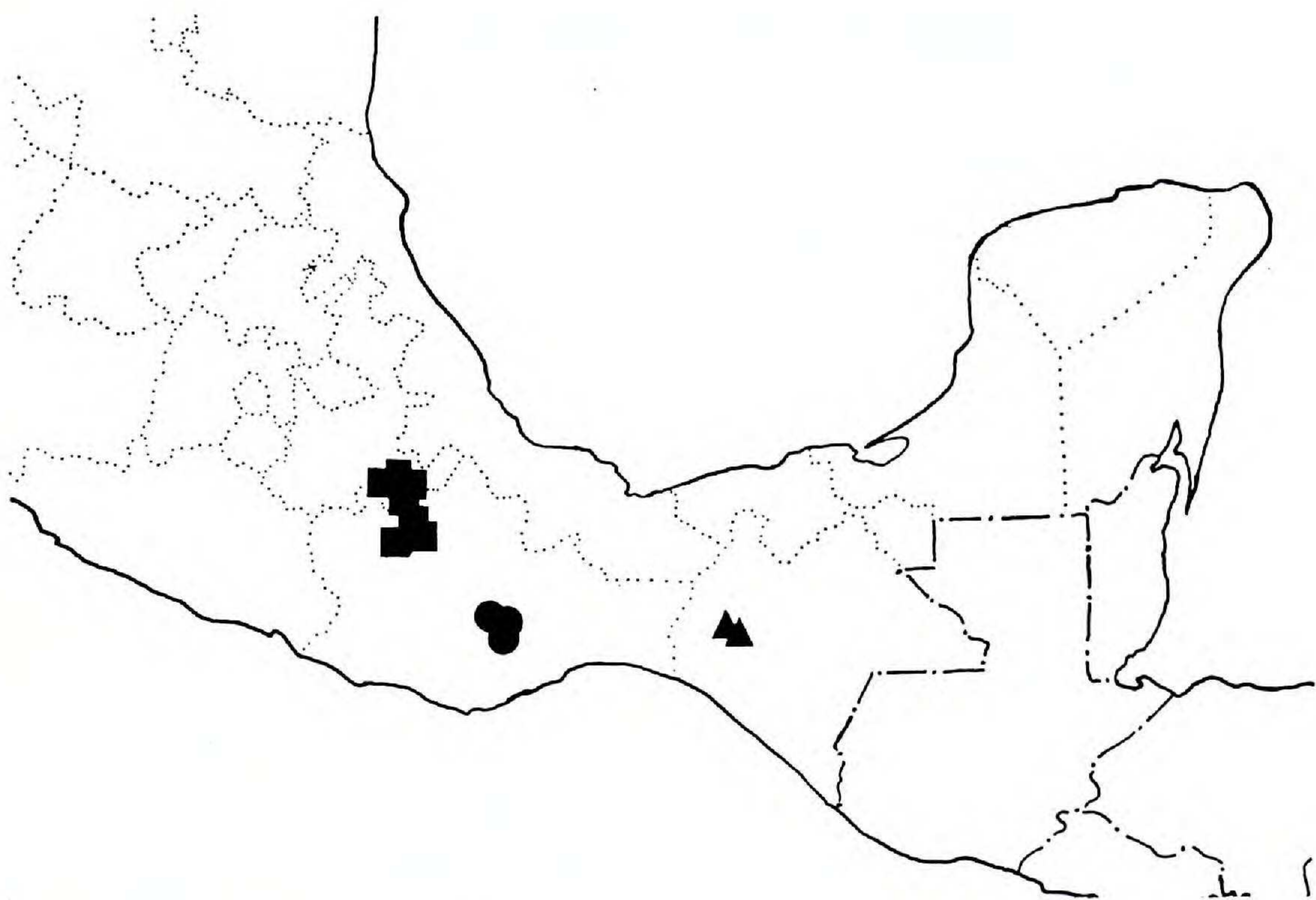


Fig. 1. Distribution of *Gymnolaena* as shown by herbarium records. Squares indicate *G. oaxacana*, circles *G. serratifolia* and triangles *G. chiapasana*.

volucra 17-20 mm. alta; phyllaria ca. 13 glandulis parvis ellipticis numerosis (11-25) ornata. Receptaculum breviter conicum foveolatum. Flores radii 8-12, disci 30-40.

Shrubs; stems striate, glabrous. Leaves opposite, lanceolate, attenuate, (5-) 8-15 cm long, 1.5-3.5 cm wide, serrate, sessile, bearing 2-4 lance-subulate lobes (3-8 mm long) at the base, dotted with numerous, tiny glands. Peduncles 2-10 cm long, glabrous, striate, swollen beneath the capitula, bearing 5-11 linear bracts ca 6 mm long; calyculum of 0-3 linear bracts similar to those of the peduncle; involucre 17-20 mm high, 8-10 mm through; phyllaries ca 13, in one series, united nearly to the minutely crisp-hairy tips, each with numerous (11-25), small, elliptic glands. Receptacle a short, foveolate cone. Ray florets 8-12, corollas red-orange, tube slender, 6-7 mm long, puberulent lamina elliptic 7-8 mm long, 3-4 mm wide; disc florets 30-40, corollas ca 9 mm long, slender, minutely puberulent, tube 5 mm long, lobes linear-lanceolate, ca 1.5 mm long; style branches bearing long, subulate, hispidulous appendages. Pappus of 15-20 squamellae, each dissected into 7-10 bristles, the longest 9-11 mm; achenes slender, rather clavate, 6 mm long, black, subsericeous.

Distribution (Fig. 1): Known only from the collections cited.

Specimen examined in addition to the type and isotypes: Chiapas: Barranca between S. Fernando and S. Cristobal, west of Tuxtla Gutierrez, 1 Feb 1949, I. K. Langman 3837 (US).

Gymnolaena chiapasana is closely related to *G. oaxacana* from which it is distinguished by its larger heads, greater number of florets, more numerous and more glandular phyllaries and larger leaves with short basal lobes.

Excluded Species

Gymnolaena seleri (Rob. & Greenm.) Rydb.=*Dyssodia grandiflora* DC.

Gymnolaena integrifolia (Gray) Rydb.=*Dyssodia montana* (Benth.) Gray

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